FILIPPOV, D. P.

Cand Geol-Min Sci - (diss) "Conditions of the accumulation of coal-bearing formation C-4/2 of the Middle Carboniferous Period in the Tatsinskiy region of Eastern Donbass." Rostov-na-Don, 1961. 22 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Rostov-na-Don State Univ, Saratov Order of Labor Red Banner State Univ imeni N. G. Chernyshevskiy); 175 copies; price not given; (KL, 5-61 sup, 181)

GORDIYEVSKIY, A.V.; FILIPPOV, E.L.

Determination of the acidity of hydrofluoric acid solutions by means of an ion-exchanging membrane electrode. Zhur.fiz.khim. 36 no.10:2280-2282 O '62.                    (MIRA 17:4)

1. Khimiko-tekhnologicheskiy institut imeni Mendeleyeva, Moskva.

GORDIYEVSKIY, A.V.; FILIPPOV, E.L.

Studying the electrode functions of anion exchange membranes based on the EDE-10P resins. Trudy MKHTI no.47:172-183 '64.

GORDIYEVSKIY, A.V.; FILIPPOV, E.L.; VORONOVSKAYA, M.N.

Use of ion exchange membranes in the calcium form as indicator electrodes. Trudy MKHTI no.47:184-188  '64.

Formation of protective films on the surface of cast iron. Ibid.:189-192

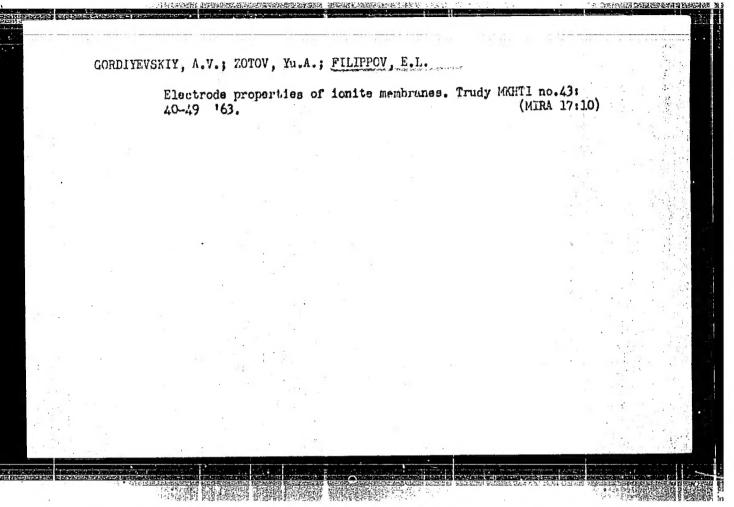Sand fused on iron castings and role of cast iron silicon in its formation. Ibid.:193-197                              (MIRA 18:9)

GORDIYEVSKIY, A.V.; FILIPPOV, E.L.; KUPRYUNIN, G.I.

Behavior of a membrane ion exchanger electrode in solutions
of hydrofluoric acid and its salts. Zhur. anal. khim. 18
no.1:13-19  Ja '63.                         (MIRA 16:4)

1. Mendeleyev Moscow Chemico-Technological Institute.
        (Hydrofluoric acid)   (Ion exchange)
                  (Electrodes)

GORD'YEVSKIY, A.V.; FILIPPOV, E.L.

Properties of an ion-exchange membrane electrode in ammonium
fluoride solutions.  Zhur. fiz. khim. 37 no.12:2780-2781 D  '63.
(MIRA 17:1)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni
Mendeleyeva.

GORDIYEVSKIY, A.V.; ZOTOV, Yu.A.; FILIPPOV, E.L.

Electrode properties of ionite membranes. Trudy MKHTI no.43:
40-49 '63.                                              (MIRA 17:10)

GORDIYEVSKIY, A.V.; FILIPPOV, E.L.; SHTERMAN, V.S.

Use of ion-exchange membranes for the control and regulation
of concentrations of some complexons.  Zhur. anal. khim. 19
no.3:282-285  '64.                                (MIRA 17:9)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni
Mendeleyeva.

GORDIYEVSKIY, A.V.; FILIPPOV, E.L.; SHTERMAN, V.S.

Use of the ion echange membrane electrode for measuring LiCl
concentration in amyl alcohol.  Zhur. fiz. khim. 38 no.5:
1344-1347  My '64.                                (MIRA 18:12)

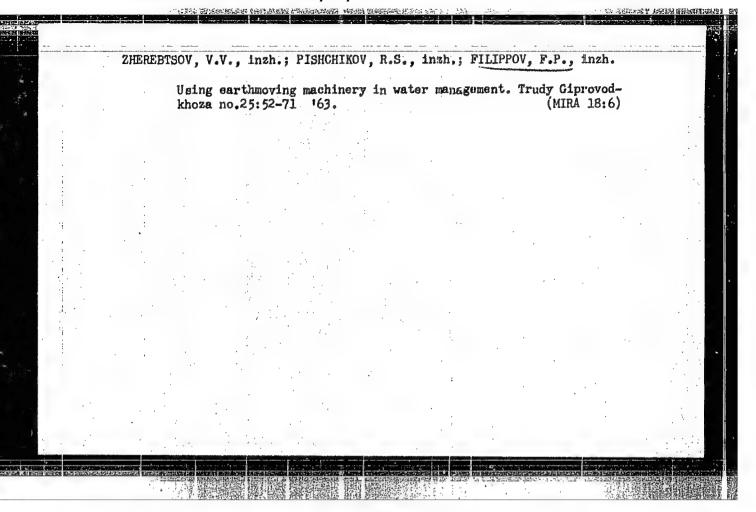1. Khimiko-tekhnologicheskiy institut imeni Mendeleyeva.
Submitted July 4, 1963.

GORDIYEVSKIY, A.V.; FILIPPOV, E.L.; SHTERMAN, V.S.; TRIZNO, V.V.

Potentiometric titration in anhydrous acetic acid by means of
an ion-exchange membrane electrode. Zhur. anal. khim. 20 no. 11:
1164-1168 '65                                    (MIRA 19:1)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni
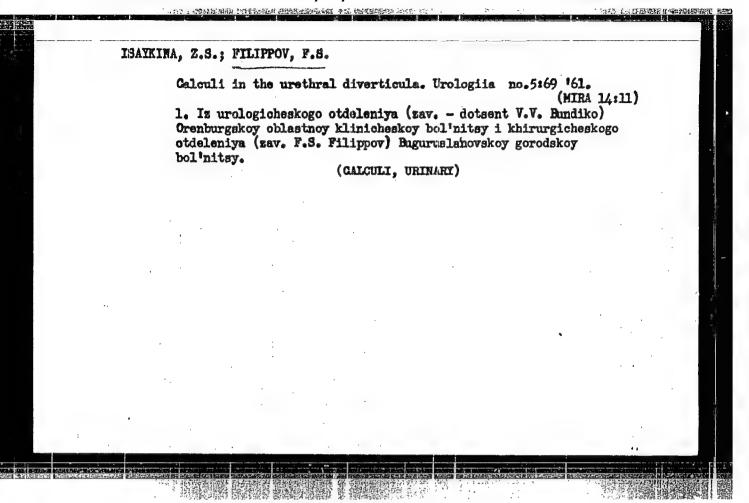D.I. Mendeleyeva. Submitted June 15, 1964.

FILIPPOV, F.F.

Machine for filing disk saws. Rats. predl. na gor. elektrotransp.
no.9:30-31 '64.                                    (MIRA 18:2)

1. Kirovskoye depo Tramvayno-trolleybusnogo upravleniya Leningrada.

MAKHOTIN, Ye.A., inzh.; PISHCHIKOV, R.S., inzh.; FILIPPOV, F.P., inzh.

New earthmoving machinery for water management construction.
Trudy Giprovodkhoza no.25:41-51  '63.                    (MIRA 13:6)

ZHEREBTSOV, V.V., inzh.; PISHCHIKOV, R.S., inzh.; FILIPPOV, F.P., inzh.

Using earthmoving machinery in water management. Trudy Giprovod-
khoza no.25:52-71 '63.                              (MIRA 18:6)

AGEYEVA, A.P.; AKSENOVA-CHERKASOVA, A.S., aspiranka; VELIKANOV, L.N.,
bibliotekar'; GAVVA, F.M.; GIRENKO, P.D., Geroy Sots. truda;
GUBANOV, M.M., pensioner; GUS'KOVA, T.K., nauchnyy sotr.;
DAVYDOV, A.G., prepodavatel'; DANILEVSKIY, V.V., prof., dvazhdy
laureat Stalinskoy premii; DOVGOPOL, V.I., laureat Stalinskoy
premii; YELOKHIN, M.F.; YERMAKOV, A.D.; IVANOV, V.G., prepoda-
vatel'; KOVALEVICH, V.K.; KOVALEVSKAYA, Ye.S., zhurnalistka;
PANKRATOV, A.G.; POPOVA, F.M.; URYASHOV, A.V.; FEDORIN, I.M.,
kand. ist. nauk; FILIPPOV, F.R.; CHUMAKOV, N.P.; SHEPTAYEV, K.T.,
zhurnalist; VAS'KOVSKIY, O.A., kand. ist. nauk, retsenzent;
KULAGINA, G.A., kand. ist. nauk, retsenzent; GORCHAKOVSKIY, P.L.,
prof., doktor biol. nauk, retsenzent; BAKHMUTOVA, V., red.;
SAKNYN', Yu., tekhn. red.

[Nizhniy Tagil]Nizhnii Tagil. Sverdlovsk, Sverdlovskoe knizhnoe
izd-vo, 1961. 294 p. (MIRA 16:1)

1. Nizhne-Tagil'skiy krayevedcheskiy muzey (for Ageyeva, Gus'kova).
2. Zaveduyushchiy gorodskim otdelom narodnogo zdravookhraneniya,
Nizhniy Tagil (for Velikanov). 3. Zaveduyushchiy gorodskim sel'-
skokhozyaystvennym otdelom goroda Nizhniy Tagil (for Gavva).
4. Nachal'nik upravleniya stroitel'stvom Sverdlovskogo sovnar-
khoza (for Girenko). 5. Deystvitel'nyy chlen Akademii nauk
Ukr. SSR, Leningradskiy politekhnicheskiy institut (for Danilevskiy).
(Continued on next card)

IZAYKINA, Z.S.; FILIPPOV, F.S.

Calculi in the urethral diverticula. Urologiia  no.5:69 '61.
(MIRA 14:11)

1. Iz urologicheskogo otdeleniya (zav. - dotsent V.V. Bundiko)
Orenburgskoy oblastnoy klinicheskoy bol'nitsy i khirurgicheskogo
otdeleniya (zav. F.S. Filippov) Buguruslahovskoy gorodskoy
bol'nitsy.

(CALCULI, URINARY)

BELASHOV, G., kand. ekon. nauk; KOZIN, A.; LYASHENKO, P.; FILIPPOV, G., dots.

"Economics, organization, and planning of grain milling" by D.N. Gavrichenkov. Reviewed by G. Belashov and others. Muk. elev. prom. 24 no.11:31-32 N '58.                                    (MIRA 11:12)

1.Moskovskiy tekhnologicheskiy institut pishchevoy promyshlennosti (for Belashov, Filippov). 2. Direktor Leningradskogo mel'nichnogo kombinata im. S.M. Kirova (for Kozin). 3.Nachal'nik Planovogo otdela Moskovskogo mel'nichnogo kombinata No.3 (for Lyashenko).
(Grain milling)
(Gavrichenkov, D.N.)

BUGRAYEV, A.; LADIKOV, A.; ZABOLOTSKIY, K.; FILIPPOV, G., kand.ekonomicheskikh
nauk

"Problems concerning the economy of grain receiving enterprises" by
A.A. Borinevich. Reviewed by A. Bugraev and others.  Muk.-elev.
prom. 28 no.6:30-32 Je '62.                                (MIRA 15:7)

1.  Moskovskoye oblastnoye upravleniye khleboproduktov (for Bugrayev).
2.  Kiyevskoye upravleniye khleboproduktov (for Ladikov).  3. Rostovskoye
upravleniye khleboproduktov (for Zabolotskiy).  4.  Moskovskiy
tekhnologicheskiy institut pishchevoy promyshlennosti (for Filippov).
                    (Grain elevators)     (Borinevich, A.A.)

S/117/60/000/012/015/022
A004/A001

AUTHORS:      Malinina, N., Molodkina, M., Datskiy, M., Filippov, G.

TITLE:        Cement Models for the Manufacture of Dies

PERIODICAL:   Mashinostroitel', 1960, No. 12, p. 36

TEXT:         Generally the complex profile of the working surface of forging dies
for blades is machined on copying milling machines according to wooden model
templets. These models lose their geometrical shape rather quick because of
temperature fluctuations and the effects of air moisture in the storing rooms.
Instead of having model sets for forging dies made of wood, the manufacture of
which takes a model maker of the 6th grade some seven days, the Leningradskiy
metallicheskiy zavod (Leningrad Metallicheskiy Plant) produces these models from
cement. The templets used for the cement-model making serve also for the checking
of the die shape during the milling operation and fitting work. At the beginning
a frame work is manufactured from templets, distance sleeves and gaging pins.
Braces are mounted on the sides of the framework, tightened by wedges and cramps.
Then diluted construction gypsum is filled into the framework, the side walls of
which are removed after the solidification of the gypsum. The profile of the die
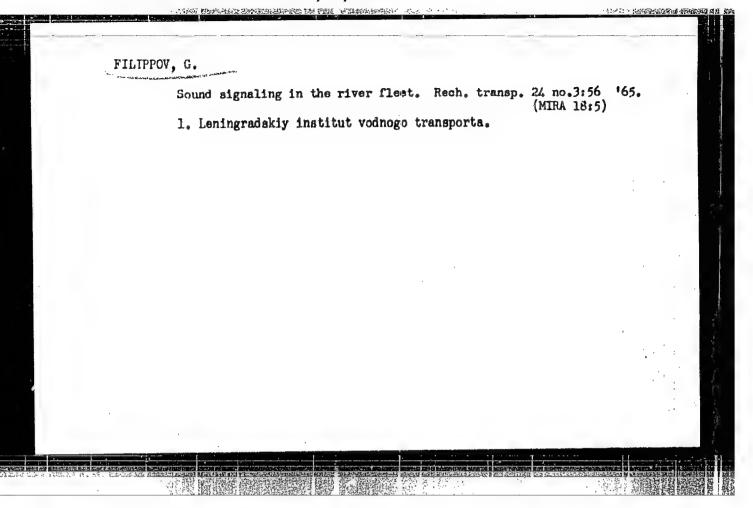
Card 1/2

Cement Models for the Manufacture of Dies

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A004/A001

model is then shaped subsequently between every pair of neighboring templets, the surplus gypsum being cut away flush with the templet profile. Those parts of the profile for which the framework does not provide a templet is done by surface gaging. The ready gypsum mold is covered with a thin nitro-lacquer coating and greased with stearin diluted with kerosene in order to prevent the gypsum from sticking to the cement. Side walls are mounted to the ready mold and the cement is poured in. The process of the cement model setting takes 3-4 days. The cast cement model-templet has a smoother and better surface than the wooden ones, while its manufacture costs by 2-2.5 times less than that of wooden model-templets. There are 4 figures.
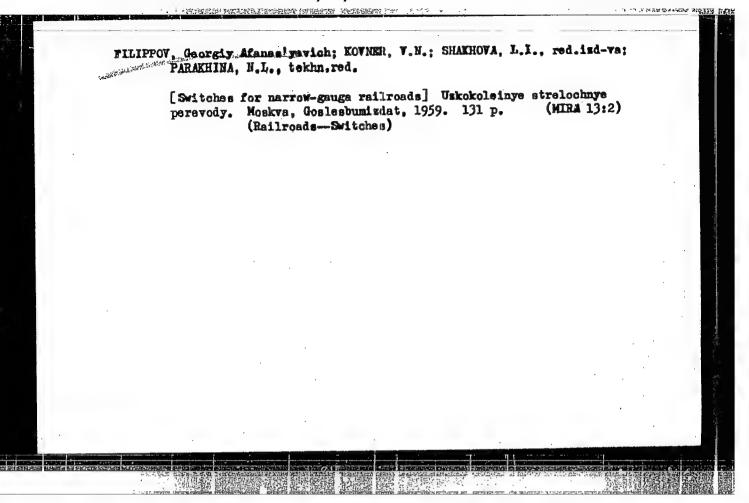
Card 2/2

FILIPPOV, G.

Sound signaling in the river fleet.  Rech. transp. 24 no.3:56  '65.
(MIRA 18:5)

1. Leningradskiy institut vodnogo transporta.

FILIPPOV, G.A., inzhener.

[Organization of lumber camp construction and the preparation of estimates]
Organizatsiia stroitel'stva lespromkhozov i sostavlenie smet.  Moskva, Gos-
lesbumizdat, 1952.  211 p.                                         (MLRA 6:11)
                        (Lumber camps)  (Lumbering--Accounting)

FILIPPOV, G. A.

Road construction

Moving earth efficiently in the construction of logging roads.   Les. prom. no. 5, 1952.

9.   Monthly List of Russian Accessions, Library of Congress, August, 1952 1953. Unclassified.

FILIPPOV, Georgiy Afanas'yevich; KOVNER, V.N.; SHAKHOVA, L.I., red.izd-va;
PARAKHINA, N.L., tekhn.red.

[Switches for narrow-gauge railroads] Uzkokoleinye strelochnye
perevody. Moskva, Goslesbumizdat, 1959. 131 p.        (MIRA 13:2)
         (Railroads--Switches)

SOV/96-60-2-3/24

AUTHORS: Deych, M. Ye., Doctor of Technical Sciences, Zaryankin, A. Ye., Candidate of Technical Sciences, Filippov, G.A., and Zatsepin, M. F., Engineers

TITLE: Methods of Increasing the Efficiency of Turbine Stages with Short Blades

PERIODICAL: Teploenergetika, 1960, Nr 2, pp 18-24 (USSR)

ABSTRACT: The efficiency of the high-pressure parts of large turbines having fixed and runner blades of improved profiles and provided with good internal glands and seals reaches 78 to 80%. Further improvements in profiling are not likely to give much better efficiency, as modern blades already have very low profile-losses. However, the efficiency of intermediate high-pressure stages can be appreciably increased by special profiling of the fixed blades in the meridional plane and by using runner blades with diffuser channels. Meridianal profiling is now being developed to give stages of constant reaction. In high-pressure stages this problem is best solved by trying to reduce the end losses. In order to reduce the end losses in fixed blades, it is necessary to reduce the velocity on sections of maximum

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Methods of Increasing the Efficiency of Turbine Stages with Short
Blades

channel curvature where secondary flows are most marked.
This ensures turbulent flow and so reduces the thickness
of boundary layers on the backs of the blading and on
the upper and lower walls of the channel.  This is
accomplished by profiling the channels along their height
(profiling in the meridional plane).  The profiling may
be symmetrical with straight or curved faces, or
asymmetrical with straight or curved generating lines.
Asymmetrical profiling makes it possible both to reduce
the end losses and to reduce the radial pressure gradient.
The present article gives test results on blading with
asymmetrical profiling over the height, both with the
blades mounted in straight rows and on rotors.  Fig 1
gives graphs of the loss distribution over the height
of a straight row of blades with different shapes of
the upper rim.  It will be seen that the best results
are obtained with asymmetrical profiling beyond the
position where the curvature of the channel is greatest.
The reduction in fixed-blade losses by the use of
Card 2/6   asymmetrical profiling is explained by reference to the

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Methods of Increasing the Efficiency of Turbine Stages with Short
Blades

graph of pressure distribution across the profile given
in Fig 2.  It is also pointed out that in the blading
with asymmetrical profiling the point of minimum pressure
is displaced somewhat in the direction of flow.  Hence
the length of the turbulent section and the pressure
gradients in it are somewhat reduced.  This has the effect
of reducing the profile losses.  The loss-coefficient
curves plotted in Fig 3 clearly show the advantages of
blades with asymmetrical profiling over the height,
particularly for short blading.  The effect of this
special profiling is greater when the blades are mounted
on a rotor because the losses at the blade roots are
particularly reduced, thereby helping to equalise the
velocity distribution.  The best shape of profiling is
then considered.  Graphs of loss reduction as a function
of profiling compression, plotted in Fig 4, indicate
that the optimum amount of compression depends on the
blade length.  The shape of the compression curve may
be based on calculation of the flow potential in the
Card 3/6    channel.  A diagram of a profiled channel with three

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different degrees of compression is given in Fig 5, and
calculated and experimental velocity distributions over
a straight arrangement of blading caps TS-2A is given
in Fig 6. It will be seen that agreement between theory
and experiment is good. Tests on intermediate-stage
fixed blades with diffuser inlets showed that under
static conditions their use does not influence the
effect of asymmetrical profiling over the height. Test
results are plotted in Fig 7 and it is considered that
the use of fixed blades with a complicated shape of
outer rim increases the efficiency of intermediate
stages with short blades. Further information about
the use of fixed blades with asymmetrical profiling
was obtained by testing groups of stages in the experi-
mental steam turbine of the Moscow Power Institute.
All stages have the same mean diameter of 400 mm; the
other dimensions are tabulated. Tests were made on
six stages of various blade lengths. Some were made
with fixed blades profiled over the height and some
Card 4/6    with unprofiled blades. All the diaphragms were welded.

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The tests covered a fairly wide range of velocity ratio
and heat drop.  The results, plotted in Fig 8, indicate
that at optimum velocity ratio the stage with profiled
blades has 2% higher efficiency with a blade length of
25 mm, and 3% higher with a length of 15 mm.  The
relative increase in efficiency by the use of
asymmetrical profiling is 2.5% and 3.7 to 4% respectively.
Asymmetrically-profiled blades continue to offer
advantages when operation is not at the designed
conditions, as is explained by reference to other
curves on Fig 8.  Important results were obtained on
measuring the reaction in the blade root and tip
sections.  The use of asymmetrical profiling reduces
the variations in static pressure distribution over the
pitch in the sections.  As will be seen from the graphs
plotted in Fig 9 there was also a marked reduction in
the difference between the reactions at the root and tip.
The value of the outlet area of the guide vanes may be
calculated from formula (1).  An approximate method is
Card 5/6    given for calculating the asymmetrical profiling, using

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Blades

Eq (2). It is concluded that asymmetrical profiling of
the fixed blades across the height helps to give stages
with constant reaction over the radius. In stages
with very short blading any profiling of the channels
over the height undertaken to reduce the difference in
reaction should also be designed to reduce the end
losses. The method of asymmetrical profiling that is
proposed in this article solves these two problems.
There are 9 figures, 1 table and 4 Soviet references.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow
      Power Institute)

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S/096/60/000/08/011/024
E194/E484

AUTHORS: Deych, M.Ye., Doctor of Technical Sciences,
Zaryankin, A.Ye., Candidate of Technical Sciences,
Filippov, G.A. and Zatsepin, M.F., Engineers

TITLE: Increasing the Efficiency of Short Turbine Runner Blades

ABSTRACT: Work published in Teploenergetika, 1956, Nr 6, and by
Nippert in Germany in 1929 has shown that if the angle
through which a flow turns in a channel is great and the
static pressures at inlet and outlet are not very
different, the losses due to secondary flow in curved
ducts and in short blades are not minimum when the flow
is steadily constricted. Nippert showed that when the
flow is turned through a large angle, the use of
expansion followed by constriction of the ducts between
the blades greatly reduces the terminal losses. The
theoretical problem is very complicated and it is best
to determine the optimum velocity distribution by
experiments. Tests were made on the Moscow Power
Institute blading for subsonic speeds details of which
Card 1/6      are given in Table 1. These profiles are intended for

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Increasing the Efficiency of Short Turbine Runner Blades

short blades and were obtained by cutting back the
concave surfaces in such a way that the channel between
the blades first expands then contracts.   The convex
surface of the blade is left unaltered.   Typical duct
dimensions for blades shapes TR2A  and  TR-2Ak  are
shown in Fig 1.   In the new blades the inlet section
is greater than the outlet section and the maximum
section at the middle of the blades is greater than the
inlet section.   With blades of this type, the
variations in channel section are, of course, affected
by the pitch and angle of installation of the blading.
Tests were made with blades of various heights and
various ratios of maximum inlet and discharge widths.
The range of variation of the main geometrical
characteristics for blades of group Ak  are shown in
Table 2.   The tests were made in the wind tunnel[1] of
the Moscow Power Institute with nozzles ranging from
20 to 50 mm high.   The advantages of an expanding
and constricting channel for short blades was confirmed
Card 2/6    by experiment.   Pressure diagrams for channels of

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different shapes with blade type TR-2A are shown
in Fig 1. The results are discussed and it is
concluded that there are three causes of the reduced
terminal losses in blades with expanding and constricting
channels, namely: the direction of the flow is altered
at the lower mean speed; at the outlet section where
secondary flows are intensified, the channel is
constricted so that longitudinal pressure gradients
are increased; in cross-section the length of the
expanding section of the channel on the back of the
blade is reduced as the point of minimum pressure is
displaced in the direction of the flow. As will be seen
from Fig 2, absolute values of loss factors in blades
with channels of this type are reduced and, moreover,
the distribution of losses over the height and pitch is
more uniform. Graphs showing the relationship between
the loss factor of the blading, the height and the angle
of inlet are shown in Fig 3 for various kinds of blade.
Curves showing the relationship between the loss factor,
Card 3/6    the ratio of the maximum to the inlet section and the

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Increasing the Efficiency of Short Turbine Runner Blades

height are shown in Fig 4;  curves of the relationship
between the loss factor, the pitch and the ratio of
the maximum to the inlet section are shown in Fig 5.
Optimum geometrical parameters for blades of group Ak
are given in Table 3.   It will be seen from Fig 5 and
Table 3 that small variations in the ratio of the
maximum to the inlet section do not appreciably affect
the losses,  the comparatively marked increase in
losses at low relative pitch occurs because the channel
is of less suitable shape.   The influence of flow
conditions on the efficiency of class  Ak  blading may
be assessed from the graphs of Fig 6 and Fig 7.
Fig 6 shows the influence of inlet angle:  it will be
seen that although the inlet losses do not vary much
with inlet angle ranging from 25 to 35°  the losses are
less with blades  Ak  than with blades  A.    The influence
of compressibility and Reynolds number on losses in the
two types of blading is shown in Fig 7 and it is shown
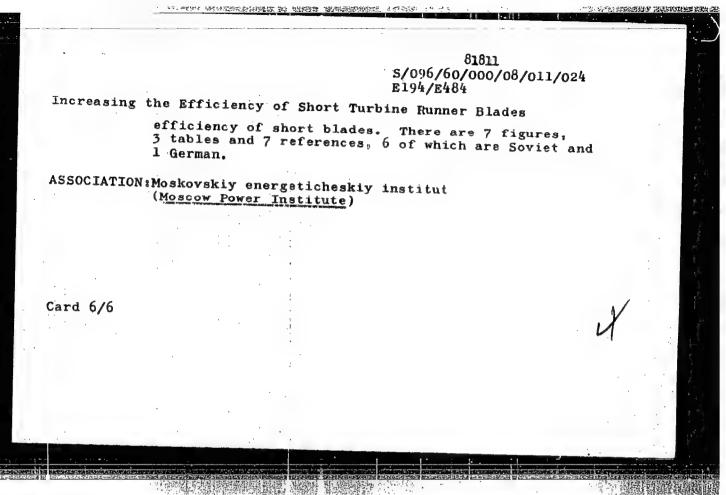that compressibility does not have an appreciable

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Increasing the Efficiency of Short Turbine Runner Blades

influence on the losses up to Mach 1.    Tests made
with blades  B  and  Bk  are shown in Fig 7b  and it
will be seen that at slightly supersonic speeds the
presence of an expanding section beyond the inlet has
a favourable effect on the losses.    It is concluded
that in blades where the flow is turned through large
angles, the terminal losses may be appreciably reduced
by using blades group  Ak  and  Bk  with expanding and
constricting channels.  The simplest way of making these
blades is to cut back the concave surfaces of blades  A
and  B  which are widely used in turbines.    The best
amount of expansion of the inlet section depends mainly
on the angle through which the flow is turned and the
relative height of the blading.    Blading of the type
described should be used with relative heights less than
2 to 3  and when the flow is turned through angles
greater than 120 to 125°.    The use of these blades
together with guide vanes type  Am  (having asymmetrical
meridional profile) gives appreciable increase in stage

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Increasing the Efficiency of Short Turbine Runner Blades

efficiency of short blades.  There are 7 figures,
3 tables and 7 references, 6 of which are Soviet and
1 German.

ASSOCIATION: Moskovskiy energeticheskiy institut
(Moscow Power Institute)

Card 6/6

26.2120

25667
S/096/61/000/009/004/008
E194/E155

AUTHORS:      Deych, M.Ye., Doctor of Technical Sciences, and
              Filippov, G.A., Engineer

TITLE:        On the design of turbine stages with long blades of
              variable profile

PERIODICAL: Teploenergetika, 1961, No.9, pp. 60-65

TEXT:         In gas turbines and more particular condensing steam
turbines, the flow parameters in the later stages vary considerably
over the height of the blade. It is important to be able to
calculate the various parameters accurately, and although a number
of methods have been proposed most of them ignore certain important
factors. The object of the present work is to refine the
determination of the parameters over the height of the blade by
taking account of the following three factors: the slope of the
blades; the curvature of the line of flow; and the opening-out of
the flow path (its expansion in the meridianal plane). In
formulating the equations it is also assumed that flow in the guide
vane channels is continuous and that changes in the radial
components of velocity along the axes are negligible. Then, with

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On the design of turbine stages with...

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E194/E155

the notation used in Fig.1 for section 1 – 1, the equation of radial equilibrium assumes the form:

$$\frac{1}{\rho_1}\cdot\frac{dp_1}{dr_1}=\frac{c_{1u}^2}{r_1}-\frac{c_{1z}^2}{R}-c_{1r}\frac{dc_{1r}}{dr_1}-F_r; \quad (1)$$

$$c_{1u}=\sqrt{\frac{c_1^2}{1+\frac{tg^2\alpha_1}{cos^2\delta}}}; \quad c_{1z}=\sqrt{\frac{c_1^2\, tg^2\alpha_1}{1+\frac{tg^2\alpha_1}{cos^2\delta}}};$$

$$c_{1r}=\sqrt{\frac{c_1^2\sin^2\alpha_1\, tg^2\delta}{1+\sin^2\alpha_1\, tg^2\delta}}; \quad (2)$$

$$F_r=\frac{F_u}{tg(90-\gamma)}=c_u\frac{dc_u}{dz\,tg(90-\gamma)}.$$

(1)

(2)

where: $p_1$ and $\rho_1$ are the static pressure and density in the gap; $c_{1u}$, $c_{1z}$, $c_{1r}$ are the peripheral axial and radial components of velocity $c_1$; $\alpha_1$ is the angle of discharge from the guide vane; $\delta$ is the angle of slope of the flow line in the gap; $R$ is the radius of curvature of the flow line in the meridianal plane; $F_r$, $F_u$ are the radial and peripheral components of force between

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On the design of turbine stages with....
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the blades and the flow; $\gamma$ is the angle of slope of the blades (see Fig.2). On this figure, the inscription on the left reads "discharge edges of blades". It is assumed that change in $c_u$ across the width of the blade B is linear over the centre line of the channel. The law of change of the radius of curvature of the current lines in the gap may be determined approximately in the general case by solution of the equations of continuity written for three sections; before the guide vanes, in the gap, and beyond the stage. It is shown that for turbine stages in which $c_{1u}$ is considerably greater than $c_{1z}$ the influence of the curvature of the flow line is important only when R is equal to or less than r. For compressor stages which are not profiled for constant circulation, the curvature of the flow line may have considerable influence on the distribution of parameters over the blade height. Finally, the following expression is obtained for the reaction:

$$\rho = 1 - (1 - \rho_k)\left(\frac{r_{1k}}{r_1}\right)^2 \cos^2 \alpha_1 \quad K_1 K_2 K_3 \left(\frac{\varphi_k}{\varphi}\right)^2 \qquad (16)$$

where $\varphi = c_1/c_{1t}$;

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$K_1 = (1 + \sin^2 \alpha_1 \tan^2 \delta)$ is a coefficient which allows for the influence of expansion of the flow path.

$$K_2 = \left( \frac{r_1 + \sqrt{r^2 - r^2}}{r_{1k} + \sqrt{r_{1k}^2 - r_0^2}} \right) 2 \sin \alpha_1 \cdot \cos \alpha_1 \cdot \frac{r_0}{B} \text{ is a coefficient}$$

which allows for the influence of blade slope.

$$K_3 = \exp \left[ \sin^2 \alpha_1 \frac{(r_1 - r_{1k})^2}{R_B \ell_1} \right] \text{ is a coefficient which allows for}$$

curvature of the flow lines.

Fig.3 shows graphs of these three correction factors $K_1$, $K_2$ and $K_3$ from which their influence may be assessed.   Formula (16) is based on a number of assumptions and no allowance is made for a number of differences between real and ideal flow.   Therefore, it is advisable to introduce into formula (16) an experimental coefficient  K  so that the equation then assumes the following form:

$$\rho = 1 - (1 - \rho_k) \left( \frac{r_{1k}}{r_1} \right)^{K \cdot 2 \cos^2 \alpha_1} K_1 K_2 K_3 \left( \frac{\varphi_k}{\varphi} \right) \tag{17}$$

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The coefficient K depends on many factors and mainly on the gradient of static pressure along the radius and height of the blade. For long blades K is nearly unity, when $d/\ell > 8$, $K \sim 1.3 - 1.4$, and for stages with $d/\ell$ less than 8, $K = 1.5-1.7$. Further correction in these values may be required when experimental data are accumulated. Values calculated by formula (17) have been compared with experimental data for certain types of stages with meridianal profiling and sloping edges and it will be seen that agreement is particularly good for stages for which $d/\ell > 8.4$.    Another important matter is the correct selection of blade twist. The effectiveness of root and peripheral sections of guide and runner blades of stages with low values of $d/\ell$ is low. Accordingly it is advisable to select the smallest possible discharge angle $\alpha_1$ in the blade root and peripheral sections, so as to reduce the flow in these sections. In stages with low values of $d/\ell$ and high super-critical pressure-drops it is of interest to use blades with sloping discharge edges. However, it is not desirable fully to equalise the reaction over the blade height, because it is then practically impossible to achieve axial flow discharge beyond the stage and so the discharge velocity losses rise.
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On the other hand, large angles of slope cause considerable increase
in profile losses and losses in peripheral sections. This point is
discussed in relation to certain test results. As the angle of
slope of the blades is increased, the difference  between the
reactions at the blade tip and at the root is much reduced. With
the particular stage geometry considered, it falls to zero when
$\gamma = 25-30°$.   It is concluded that by allowing for the three
factors; curvature of the flow lines, expansion of the flow path
and slope of the discharge edges; and also by introducing an
experimental coefficient into Eq. (17), the accuracy of
calculation of stage parameters with long blades is appreciably
increased.
There are 6 figures, 1 table and 4 Soviet references.

ASSOCIATION:   Moskovskiy energeticheskiy institut
               (Moscow Power Engineering Institute)

Card 6/8

FILIPPOV, G. A.

Cand Tech Sci - (diss) "Several approaches for increasing the
economy of degreed steam and gas turbines."  Moscow, 1961.
17 pp; (All-Union Main Board of Energy Administration, All-
Union Order of Labor Red Banner Thermotechniques Scientific
Research Inst imeni F. E.Dzerzhinskiy); 150 copies; price not
given; (KL, 7-61 sup, 248)

34665
S/114/62/000/001/002/006
E194/E455

26.2122

AUTHORS:     Deych, M.Ye., Doctor of Technical Sciences, Professor,
             Baranov, V.A., Candidate of Technical Sciences,
             Frolov, V.V., Candidate of Technical Sciences,
             Filippov, G.A., Engineer

TITLE:       The influence of blade height on certain
             characteristics of single-row turbine stages

PERIODICAL:  Energomashinostroyeniye, no.1, 1962, 6-9

TEXT:     This article describes work done in the Kafedra parovykh i
gazovykh turbin (Steam- and Gas-Turbine Department) of the MEI.
The notation used in the article is shown in Fig.1.   The stages
tested had a mean diameter $d_{cp} = 400$ mm and the value of the height
$l_1$  ranged from 48 to 10 mm.   The clearances had the following
values:   $\delta_1$, 1.2 to 1.5 mm;   $\delta_2$, 3 mm;   $\delta_3$, 0.6 to 0.8 mm;
$\delta_4$, 1.5 mm.   There were no equalizing holes in the disc.   The
stages were built up by combining a number of different types of
runner and nozzle blades so that the effective blade length and
other characteristics could be altered.   Curves are plotted of
stage efficiency and reaction as functions of the velocity ratio of

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$u/c_0$ for stages having different blade lengths.   The influence of
blade to nozzle area  $F_2/F_1$  on efficiency and the influence of the
enclosed axial clearance  $\delta_2$  and of the Reynolds number with
different blade lengths are also plotted.   It is concluded that
meridianal profiling of nozzle blading in stages with a height of
10 to 25 mm gives an appreciable increase in stage efficiency, of
the order of 2 to 3%.   In stages with this kind of profiling, there
is almost no difference between the reaction at the blade tip and
that at the blade root.   When the blades are short, the efficiency
falls off more rapidly than is the case with long blades if the
velocity ratio is not of the optimum value, within the range of
$u/c_0 = 0.4$ to $0.58$.   Other things being equal, the mean stage
reaction depends very much on the height of the blades, and it
increases as the blades become shorter.   When the blades are short
the area ratio  $F_2/F_1$  has less influence on the stage efficiency
than when they are long.   The magnitude of the optimum relative
enclosed axial clearance  $\delta_2$  diminishes as the blades are
shortened.   The Reynolds number was found to have an influence on
the optimum value of this clearance for stages with short blades.
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JY/00

S/147/62/000/002/014/020
E191/E535

26.2120

AUTHORS:      Gubarev, A.V., Filippov, G.A., Lazarev, L.Ya. and
              Pand'ya, A.D.

TITLE:        A method of design and the results of investigations
              of a bladeless guiding assembly for radial-axial
              turbines

PERIODICAL:   Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya
              tekhnika, no.2, 1962, 113-123

TEXT:         A simplified analysis of the flow rests on the
assumptions of an ideal gas, a uniform distribution of the flow
parameters in the outlet section of the volute, and the flow
parameters at the outlet section of the entry socket being constant
in each cross-section of the volute. Analysis of the continuity
equation shows the ratio of the inlet and outlet velocities in the
volute to be the main parameter which determines the volute
geometry. This ratio (the "acceleration factor") also determines
whether a bladeless assembly is advisable and when it drops below
0.5, a bladed one is preferable.   As the acceleration factor
increases, the radius of the volute decreases. Various relations

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A method of design and the results ... S/147/62/000/002/014/020
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are derived and illustrated in graphs between the volute dimensions
and the acceleration factor.  The model of a bladeless stator for
a rotor diameter of 130 mm, a rotor width of 12 mm and a flow
angle of 12° at the rotor entry was tested in the laboratory.
Energy losses in 16 cross-sections around the periphery were
measured together with the flow angles and static pressures. The
static pressures were also measured in the entry socket and along
the mean volute line.  Conclusions: the design procedure put
forward permits the determination of the volute geometry and the
behaviour of the volute flow under non-design conditions.  The flow
exit angle from the bladeless assembly depends on the flow
velocity even at sub-critical heat transfer conditions.  The
efficiencies of bladeless and bladed assemblies (with well
developed entry sockets) are equal.  The volute must be accurately
machined to avoid distortion of the velocity field at the turbine
inlet.  The limits of application of the bladeless stator have not
yet been fully explored.  There are 9 figures.

ASSOCIATION:  Moskovskiy energeticheskiy institut, Kafedra
Card 2/2      parovykh i gazovykh turbin (Moscow Power Engineering
              Institute, Department of Steam and Gas Turbines)
SUBMITTED:    November 17, 1961

S/096/62/000/003/001/008
E194/E455

AUTHORS:     Shcheglyayev, A.V., Corresponding Member of the AS USSR,
             Deych, M.Ye., Doctor of Technical Sciences, Professor,
             Filippov, G.A., Candidate of Technical Sciences

TITLE:       The design of steam turbine stages, from the results of
             static blowing tests on rows of blades

TEXT:     Two methods are in common use for designing the flow paths
of steam turbines.    One is based on the use of generalized graphs
obtained from the tests on stages.    With this method the
calculations are simple and reliable for the given type of blading,
and various generalized graphs have been produced.    The second
is based on the use of the energy loss factor and flow factors in
guide and runner blades, either derived from static tests or
calculated from the velocity triangle.    This method is also
useful, particularly with new types of blade.    A wealth of test
results is now being obtained on blades in straight bundles, giving
both a qualitative view of the flow structure in various kinds of
blading and quantitative characteristics for loss, angles and flow
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The design of steam turbine ...

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factors.   An atlas of rational blade profiles has been built up
from these tests.   Over a number of years, the Kafedra parovykh
i gazovykh turbin (Department of Steam and Gas Turbines) of MEI
has made studies of flow in turbine blades, using both flat
bundles and annular stationary models.   Moreover, the blades
tested were run in experimental turbines to obtain
relationships between efficiency and velocity ratio, using both
superheated steam and air.   The results so obtained can bridge
the gap between the losses determined in static tests and the
efficiency of actual stages running on steam.   A number of loss
curves obtained with various kinds of stage with different kinds
of test are plotted and compared, and results are also given for a
section of a turbine consisting of three stages.   The results
lead to the following conclusions.  When the design of single-row
stages is based on the results of static blowing tests on flat
bundles of blades with an irregular velocity distribution and in
the presence of overlap, there is satisfactory agreement with
tests in experimental turbines in the region of low velocity
ratio $u/c_0$. For optimum values of $u/c_0$ the divergence between
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The design of steam turbine ...

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test and calculated values is 1.5 to 3%.    Generally, a
satisfactorily reliable result can be obtained by multiplying the
calculated efficiency by a correction factor of 0.98 to 0.97.
When calculating the stage efficiency from the loss factors given
in the atlas of blade profiles, the correction factor is 0.97 to
0.95 in the zone of optimum velocity ratio.    For wheels with two
rows of blades the correction factor is 0.97 to 0.95 when the
calculations are made from tests carried out with allowance for
irregularity of velocity distribution and for overlaps.    When the
loss factors given in the atlas are used, the correction factor
should be 0.95 to 0.92.    The least divergence between test and
calculated data is obtained in stages with long blades, which
indicates that end losses in the blades are not being sufficiently
allowed for.    Correction factors for relating the result of tests
on stages in experimental turbines to calculated values from static
blowing tests are valid for stages manufactured with welded
diaphragms.    The results given in this article are only a first
step in relating the results of static tests to total losses
determined in an experimental turbine.    Further material must be
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accumulated to improve the reliability of turbine stage
calculations.   There are 7 figures and 1 table.

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DEYCH, M.Ye., doktor tekhn.nauk, prof.; GUBAREV, A.V., kand.tekhn.nauk;
FILIPPOV, G.A., inzh.; VAN CHZHUN-TSI [Wang Chung-ch'i]

New method for profiling the guiding lattices of stages with low $d/l$
ratio.   Teploenergetika 9 no.8:42-47 Ag '62.          (MIRA 15:7)

1.  Moskovskiy energeticheskiy institut.
              (Turbines)

S/114/63/000/002/003/003
E194/E155

AUTHORS:    Gubarev, A.V., Candidate of Technical Sciences,
Fillippov, G.A. (Engineer), and Pand'ya, A.D. (Engineer)

TITLE:    A bladeless guide arrangement for centripetal turbines

PERIODICAL: Energomashinostroyeniye, no.2, 1963, 38-39

TEXT:    Centripetal turbines, which are used to give low
output combined with high efficiency, currently use bladed guide
arrangements which are efficient only with low gas inlet speeds.
Helical bladeless swirlers are simpler and smaller.  They are based
on the principle of accelerating the gas in a centripetal swirl by
tangential delivery of the gas to the spiral casing ("scroll").
In designing this arrangement it is necessary to calculate the
section of the spiral at a number of positions.  Non-viscous
uni-dimensional flow is assumed.  The following design formulas
are derived:

$$q_\varphi F_\varphi = q_1 \pi d_1 \ell_1 \left[ \frac{2\pi - \varphi}{2\pi} \right] \sin \alpha_1 \qquad (5)$$

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A bladeless guide arrangement ...       S/114/63/000/002/003/003
                                        E194/E155

$$\lambda_\varphi r_\varphi = \lambda_1 \frac{d_1}{2} \cos \alpha_1 \qquad (6)$$

where: q - quantity of gas; F - cross-sectional area of spiral;
d - discharge diameter; $\ell$ - height; $\alpha$ - discharge angle. The
suffix 1 relates to discharge conditions; the suffix $\varphi$ to
conditions at an angle $\varphi$ from inlet. Tests were made on guide
equipment designed to these formulas with a discharge diameter of
130 mm and height of 12 mm with $\alpha_1 = 12°$. Losses were plotted
for a number of sections and varied considerably over the height
of the guide equipment, particularly at low gas speeds. Discharge
angles also varied. However, the losses were no greater than in
a bladed guide equipment, and bladeless equipment should be used
because it is smaller, lighter and easier to make. The design
formulas recommended are accurate enough for practical purposes.
Some of the variations in discharge angle probably resulted from
manufacturing errors in spiral dimensions.
There are 5 figures.

Card 2/2

DEYCH, M.Ye., doktor tekhn. nauk; FILIPPOV, G.A., kand. tekhn. nauk; ABRAMOV, V.I., inzh.

Study of single-crown stages with partial steam supply.
Teploenergetika 10 no.7:16-21 Jl '63.          (MIRA 16:7)

1. Moskovskiy energeticheskiy institut.
          (Steam turbines)   (Gas turbines)

DEYCH, M. Ye., doktor tekhn. nauk, prof.; FILIPPOV, G.A., kand. tekhn. nauk

Study of turbine stages with annular diffusers. Teplooenergetika
10 no.10:18-23 O'63                                    (MIRA 17:7)

1. Moskovskiy energeticheskiy institut.

ACCESSION NR:  AP4041175                                    S/0096/64/000/007/0074/0078

AUTHORS: Deych, M. Ye (Doctor of technical sciences, Professor); Filippov, G. A.
(Candidate of technical sciences); Nauman, V. (Engineer)

TITLE:  Lemniscate method for constructing profiles of subsonic lattices

SOURCE:  Teploenergetika, no. 7, 1964, 74-78

TOPIC TAGS:  turbine, turbine lattice, lemniscate profile, turbine blade profile,
turbine characteristic, turbine loss, turbine design

ABSTRACT:  A method using lemniscate curves for constructing profiles of reactive
and active lattices of subsonic turbines was studied because other profiling
methods are difficult.  New profiles may be constructed from a series of lattices
by making small changes in the geometry at the entrance and exit cross sections
of two closely similar profiles.  Experiments showed that this method produced
highly efficient profiles for directional and working lattices over a broad range
of entrance and exit angles for subsonic speeds.  The lemniscate $(x^2 + y^2)^2 =$
$a^2(x^2 - y^2)$ was found to be most favorable because it permits the choice of

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ACCESSION NR: AP4041175

the point of maximum curvature and insures smoothly changing curvatures. Changing the ordinate scale ($y' = k,y$) shifts the highest point of the profile back along the line $x = 0.625a$ and produces the desired form for any angle of entry and exit. The flow at the concave surface takes place with negative pressure gradients, and the concave surfaces under the negative pressure gradients need be less accurately profiled, so curves other than lemniscate may be used. The profile is considered in three sections: 1) the back of the profile—a straight line in two lemniscate sections; 2) the concave surface—an arc, in part a lemniscate; 3) the entrance and exit sections of the profile—arcs of circles. To construct a profile, the entrance angle $\alpha_0$ $(\beta_1)$ and exit angle $\alpha_{1ef}$ $(\beta_{2ef})$, the span or width of the profile, and the speed are needed. As an example a ten-step profile construction is presented, with the lemniscate method used for constructing profiles and canals of lattices for an exit angle $\alpha_1$ $(\beta_2)= 10$, 15, 22, 30, and $40^\circ$ with entrance angle $\alpha_0$ $(\beta_1) = 20$-$160^\circ$. The change in form of a profile with a fixed entrance angle, $\alpha_0 = 90^\circ$ and with changing exit angles was shown. Four profiles with $\alpha_0 = 90^\circ$ and $\alpha_1 = 10$, 15, 20, and $40^\circ$ were tested. The profile losses and .

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ACCESSION NR: AP4041175

total losses were found as a function of the Mach number and pressure distribu-
tions along the profiles were plotted. A comparison of the new profiles with
the best of previously studied and tested ones indicated small losses in the
lemniscate lattices for a broad range of exit and entrance angles. With small
corrections the lemniscate method may be used for constructing long curved blades.
Orig. art. has: 6 figures and 2 tables.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Engineering
Institute)

SUBMITTED: 00

SUB CODE: PR                         NO REF SOV: 003

ENCL:    00

OTHER:   000

Card 3/3

AUTHORS: Deych, M. Ye. (Doctor of technical sciences, Professor); Filippov, G. A. (Candidate of technical sciences); Stekol'shchikov, Ye. V. (Engineer)

TITLE: Speed of sound in two-phase media

SOURCE: Teploenergetika, no. 8, 1964, 33-36

TOPIC TAGS: two phase medium, steam water, elastic component, elasticity modulus, speed of sound, polytropic process, mean speed ratio, Stokes flow, water droplet, wave front

ABSTRACT: The propagation of disturbances in a two-phase medium has been studied analytically, and the results are compared to values obtained experimentally. Guck's simplified model of a piston applying a force P on a steam-water system is considered, where the steam represents the elastic component of the mixture with elasticity modulus E or

$$\frac{P}{F} = E\frac{dS}{dz},$$

where dS- distance piston moves in time dt, dz- length of gas set into motion by piston. For a water content of 1-x in the steam an expression is then obtained for the speed of sound in a

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ACCESSION NR: AP4042618

polytropic process of index m, or
$$a = \sqrt{\frac{m \cdot P}{x\rho\left(1+\frac{1-x}{x}\cdot\frac{c_2}{c_2}\right)}} \;,$$
where $C_B/C_\pi$ – mean

speed ratio of water droplets and steam, $\rho$ – density of water-steam mixture. Furthermore, a formula is arrived at for the mean speed ratio, using Stoke's flow for the spherical water droplets. This yields
$$\frac{c_2}{(c_2)_0} = \frac{\tau_0}{T}\left[e^{-\frac{T}{\tau_0}} + \frac{T}{\tau_0} - 1\right] \;,$$

$\tau_0$ – time constant $\tau_0 = \frac{2}{9}\frac{\rho_2 r^2}{\mu_2}\;,$ T – time during which pressure rises or falls at the wave front. The expression for "a" is then compared to the experimental data obtained at the Moscow Institute of Heat Power in the steam-water region $1 > x > 1-0.75$ and $T = 10^{-4}$ sec. Water droplets had estimated diameters of $10^{-4}$ to $10^{-3}$ cm. Measurement accuracy amounted to $\pm 1.5\%$ in the magnitude of "a".

Although experimental data cover a very small range, they show a good agreement with the values predicted by the expression for "a" above. Orig. art. has: 14 formulas and 5 figures.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Institute of Heat Power)

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ACCESSION NR: AP4042618

SUBMITTED: 00                                              ENCL:    00

SUB CODE: ME,GP              NO REF SOV: 004               OTHER:   002

Card  3/3

ACCESSION NR: AP4012338                           S/0096/64/000/0C2/0018/0024

AUTHORS: Deych, M. Ye. (Doctor of technical sciences); Stekol'shchikov, Ye. V.
(Engineer); Filippov, G. A. (Candidate of technical sciences)

TITLE: On pressure measuring tubes in pulsating gaseous flows

SOURCE: Teploenergetika, no. 2, 1964, 18-24

TOPIC TAGS: turbulent stream, error analysis, flow oscillation, auxiliary element,
pitot tube, total pressure, friction, heat transfer

ABSTRACT: Error sources of pressure measuring tubes in turbulent streams were
discussed analytically. The error analysis is represented as the sum of dynamic
error $\xi_D$ independent of flow oscillation frequency and geometry of the measuring
system, and the dynamic error by $\xi_A$ of auxiliary elements of the pressure
measuring device. The latter in turn is divided into three subdivisions: error in
the incoming branch of the system $\xi_{in}$, errors in the main line $\xi_m$, and errors in
the manometer itself. The analysis of $\xi_D$ is illustrated by means of a pitot tube
which leads to an expression of the form

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$$\xi_{m.m} = \left[ \frac{\bar{p}_0 - \bar{p}'_0}{\left( \rho_\infty \frac{c^2}{2} \right)_0} \right] \cdot 100\%$$

where $\bar{p}_0$ - total pressure and $\bar{p}'_0$ - mean pitot pressure per period T. The incoming branch error, $\xi_{in}$, is represented in a similar form where $\bar{p}'_0$ is the stagnation pressure including nonlinear field deformations. The main line error $\xi_m$ is shown to be the sum of losses due to friction, heat transfer and local resistance, normally not accounted for in flow pressure measuring devices. The manometer error is estimated from mass inertia considerations. It is shown that the combined effect of these errors might lead to discrepancies in flow measurements by as much as 200%. Orig. art. has: 33 formulas, 8 figures, and 1 table.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Engineering Institute)

SUBMITTED: 00                                                                      ENCL: 00

SUB CODE: ME                    NO REF SOV: 003                        OTHER: 000
Card  2/2

DEYCH, M.Ye., doktor tekhn. nauk, prof.; FILIPPOV, G.A., kand. tekhn. nauk;
BARANOV, V.A., kand. tekhn. nauk; PRYAKHIN, V.V., inzh.; KUSTOV, O.P.,
inzh.

Effect of humidity on the efficiency of a bandaged and nonbandaged
turbine stage. Energomashinostroenie 10 no.8:21-26  Ag '64.
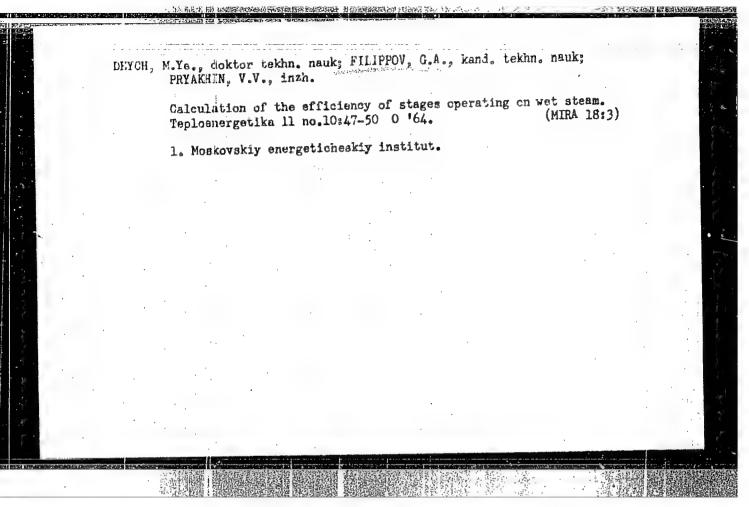                                                        (MIRA 17:11)

DEYCH, M.Ye., doktor tekhn. nauk, prof.; FILIPPOV, G.A., kand. tekhn. nauk; NAUMAN, V., inzh.

Lemniscate method for constructing the profiles of subsonic lattices. Teploenergetika 11 no.7:74-78  Jl '64.

(MIRA 17:8)

1. Moskovskiy energeticheskiy institut.

DEYCH, M.Ye., doktor tekhn. nauk; FILIPPOV, G.A., kand. tekhn. nauk;
PRYAKHIN, V.V., inzh.

Calculation of the efficiency of stages operating on wet steam.
Teploenergetika 11 no.10:47-50 O '64.                (MIRA 18:3)

1. Moskovskiy energeticheskiy institut.

DEYCH, M.Ye., doktor tekhn. nauk; FILIPPOV, G.A., kand. tekhn.
nauk; LAZAREV, L.Ya., inzh.; KAZANDZHAN,P.K.,doktor tekhn.
nauk,prof.,retsenzent
[Atlas of the profiles of the cascades of axial-flow
turbines] Atlas profilei reshetok osevykh turbin. Mo-
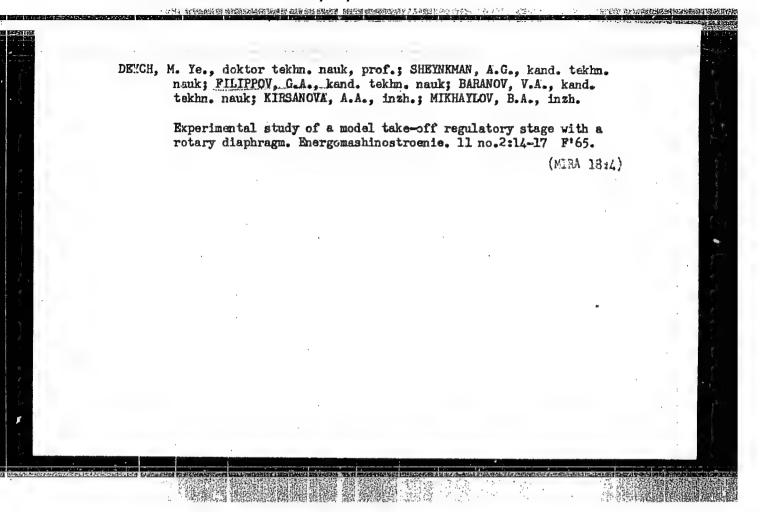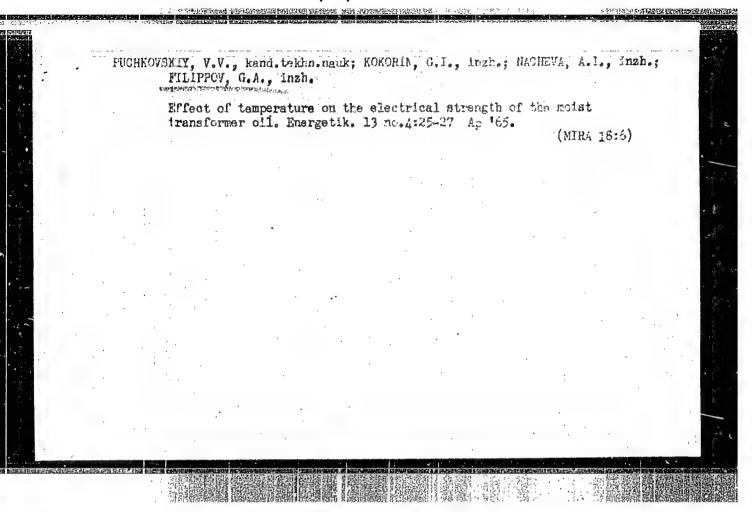skva, Mashinostroenie, 1965.  96 p.     (MIRA 18:2)

PUCHKOVSKIY, V.V., kand. tekhn. nauk; FILIPPOV, G.A., inzh.

Electrical strength of oil gaps with pulsating voltages. Izv. vys.
ucheb. zav.; energ. 8 no.1:28-33  Ja '65.

(MIRA 18:2)

1. Ivanovskiy energeticheskiy institut imeni V.I. Lenina. Predstav-
lena kafedroy elektricheskikh setey, sistem i tekhniki vysokikh
napryazheniy.

DEYCH, M. Ye., doktor tekhn. nauk, prof.; SHEYNKMAN, A.G., kand. tekhn.
nauk; FILIPPOV, G.A., kand. tekhn. nauk; BARANOV, V.A., kand.
tekhn. nauk; KIRSANOVA, A.A., inzh.; MIKHAYLOV, B.A., inzh.

Experimental study of a model take-off regulatory stage with a
rotary diaphragm. Energomashinostroenie. 11 no.2:14-17  F'65.

(MIRA 18:4)

PUCHKOVSKIY, V.V., kand.tekhn.nauk; KOKORIN, G.I., inzh.; NACHEVA, A.I., inzh.; FILIPPOV, G.A., inzh.

Effect of temperature on the electrical strength of the moist transformer oil. Energetik. 13 no.4:25-27 Ap '65.

(MIRA 18:6)

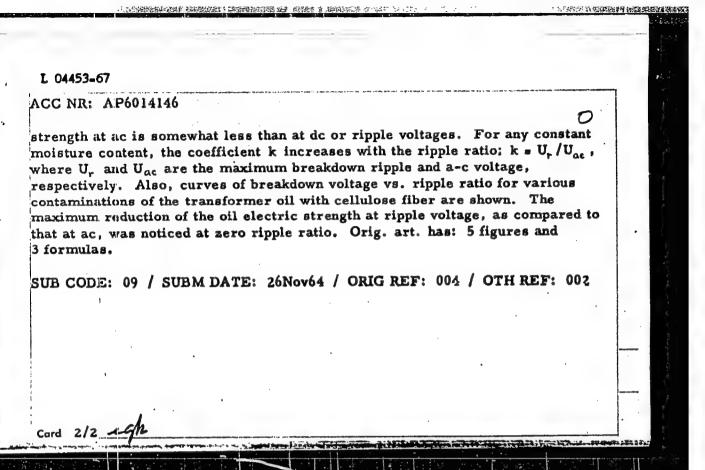L 21734-66    EWT(d)/EWT(1)/EWP(m)/EWT(m)/EWP(w)/EWP(v)/T-2/EWP(k)/EWA(h)/ETC(m)-6/EWA(  )
ACC NR: AP6005889  ( N )       SOURCE CODE:  UR/0096/65/000/011/0029/0034
WW/EM

AUTHOR:  Filippov, G. A. (Candidate of technical sciences); Pryakhin, V. V. (Engineer)

ORG:  Moscow Power Institute (Moskovskii energeticheskii institut)

TITLE:  Calculation of the discharge characteristics of nozzle equipment

SOURCE:  Teploenergetika, no. 11, 1965, 29-34

TOPIC TAGS:  turbine design, gas discharge, nozzle flow

ABSTRACT:  To calculate the discharge of steam or gas through the nozzles and the working grids of a turbine, it is necessary to know the true nature of the flow of the steam or the gas in the channels. The presence of a boundary layer on the contours of the profiles, non-uniformity of the pressure and velocity fields over the cross section of the channel, secondary currents, deviation of the parameters of the steam from equilibrium conditions during expansion of wet steam, and other factors which are difficult to calculate, lead to a deviation of the actual discharge from the theoretical. For this reason in practical calculations, there are introduced discharge coefficients, equal to the

Card 1/2                                    UDC:  621.165:533.6.001.24

L 21734-66

ACC NR: AP6005889                                                                           $O$

ratio of the actual to the theoretical discharge, $\mu = G/G_T$. Using these
coefficients, the article presents a method of calculating the effect
of various geometric and operating parameters, as well as of the mois-
ture content of the steam, on the discharge characteristics of turbine
stages. Orig. art. has: 14 formulas and 6 figures.

SUB CODE: 13, 20/ SUBM DATE: none/ ORIG REF: 002

Card 2/2

L 04453-67   EWT(m)/T   DJ

ACC NR: AP6014146   (A)      SOURCE CODE: UR/0143/65/000/012/0021/0024

AUTHOR: Filippov, G. A. (Engineer); Konovalov, B. Ya. (Engineer); Kosarev, S. B. (Engineer)

imeni V. I. Lenin

ORG: Ivanovo Power-Engineering Institute (Ivanovskiy energeticheskiy institut)

TITLE: Effect of voltage ripple ratio on electric strength of transformer oil

SOURCE: IVUZ. Energetika, no. 12, 1965, 21-24

TOPIC TAGS: transformer oil, power rectifier, voltage ripple ratio

ABSTRACT: The results of an experimental study of the electric strength of transformer oil are reported. Dry transformer oil was humidified or contaminated and its breakdown strength was determined. The dissolved (not emulsified) water caused a very considerable reduction of the electric strength: from 70—80 kv down to about 30 kv for moisture content from 0 to 0.007%. The reduction of the electric

Card   1/2                              UDC: 621.315.615.2.015.5

L 04453-67

ACC NR: AP6014146

$O$

strength at ac is somewhat less than at dc or ripple voltages. For any constant moisture content, the coefficient k increases with the ripple ratio; $k = U_r / U_{ac}$, where $U_r$ and $U_{ac}$ are the maximum breakdown ripple and a-c voltage, respectively. Also, curves of breakdown voltage vs. ripple ratio for various contaminations of the transformer oil with cellulose fiber are shown. The maximum reduction of the oil electric strength at ripple voltage, as compared to that at ac, was noticed at zero ripple ratio. Orig. art. has: 5 figures and 3 formulas.

SUB CODE: 09 / SUBM DATE: 26Nov64 / ORIG REF: 004 / OTH REF: 002

Card 2/2

L 11339-67    EWT(d)/EWT(m)/EWP(k)/EWP(w)/EWP(v)    IJP(c)  EM
ACC NR:   AP6029863             (N)            SOURCE CODE: UR/0096/66/000/009/0074/0078

AUTHOR:  Filippov, G. A. (Candidate of technical sciences); Sapozhnikov, V. N.
(Engineer; Dissertant)

ORG:  MEI-KTZ

TITLE:  Investigation of the operation of a group of stages

SOURCE:  Teploenergetika, no. 9, 1966, 74-78

TOPIC TAGS:  turbine, turbine stage, turbine blade, turbine design

ABSTRACT:  The results of investigations carried out on four groups of turbine stages
with cylindrical and curved blades with relative heights of 0.3—0.7 are presented.
It was found that the efficiency of the turbine flow section between the inlet and
exit depends on the conditions of flow transition from one stage to another.  The
coefficient characterizing the utilization of the exit velocity was approximately
equal to 0.86; it decreased sharply at relative velocities of 0.30—0.55.  Recommen-
dations for obtaining economical relative velocities and blade cascades as well as
formulas for calculating the efficiency of individual turbine stages or blade cascades
are given.  Orig. art. has: 7 figures, 16 formulas, and 1 table.

SUB CODE: 21 / SUBM DATE: none/ ORIG REF: 004/

                                      UDC: 621.165.533.6.001.5

Card  1/1

FILIPPOV, G. F.

"Moment of Inertia of a System of Interacting Particles.

report presented at the International Conference on Nuclear Reactions, Amsterdam, 2-7 July 1956.

FILIPPOV, G. F.

USSR/Nuclear Physics - Nuclear Reactions.                  C-5

Abs Jour   :  Ref Zhur - Fizika, No 4, 1957, 8788

Author     :  Davydov, A.S., Filippov, G.F.
Inst       :  Moscow State University.
Title      :  Concerning the Problem of Scattering Lengths of Slow
              Neutrons on Deuterons.

Orig Pub   :  Zh. eksperim. i teor, fiziki, 1956, 31, No 2, 340-341.

Abstract   :  Scattering of slow neutrons on deuterons is fully deter-
              mined by two scattering lengths $a_{3/2}$ and $a_{1/2}$ correspon-
              ding respectively to two possible spin states of the
              system.  According to the experimental data two variants
              of the values of the scattering length are possible.
              A qualitative estimate made by the authors, based on the
              Pauli principle, favors one of the variants, namely $a_{3/2} =$

              $= 6.2 \times 10^{-3}$ cm, and $a_{1/2} = 0.8 \times 10^{-3}$ cm.

Card 1/1

FILIPPOV, G. F. and DAVYDOV, A. S.


"Collective Excitation of Even-Even Atomic Nuclei,"

paper submitted at the All-Union Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.

Moscow State University

FILIPPOV, G.F.

56. 4. 24/52

AUTHOR        DAVYDOV, A.S., FILIPPOV, G.F.

TITLE         Moment of Inertia of a System of Particles in Interaction
              (Moment inertsii sistemy vzaimodeystvuyushchikh chastits. Russian)

ABSTRACT      The paper under review investigates the problem of the cutoff of the
              collective motions in a system consisting of N particles in interaction
              with each other.

              A system consisting of three particles of equal masses. - In this
              chapter, the authors investigate three particles without spin and of
              equal masses m, these particles being in interaction with each other
              by central forces of any arbitrary kind. By introducing new coordinates,
              the authors of the paper under review go over to the center-of-mass
              system. The paper under review follows the computations step by step.
              For the following magnitudes explicit expressions are given. - poten-
              tial energy of the system, operator of the total angular momentum of
              the entire system, Hamilton's operator of the entire system. The opera-
              tors of the square of the total angular momentum and of its projectum
              commute with the total Hamiltonian. For this reason, the magnitude cor-
              responding to these operators are integrals of the motion. The system
              of equations as obtained in the paper under review is then a good appro-
              ximation, if (a) the three-particles system is symmetrical about an axis

Card 1/2

Moment of Inertia of a System of Particles in Interaction  56-4-24/52

in the system of coordinates connected with these particles, and (b) the $\xi$-axis of the system is identical with the axis of symmetry. The next chapter deals with a system consisting of three particles of different masses. Here two masses are equal to each other, whereas the third mass is considerably smaller. The third chapter of the paper under review finally is concerned with a system consisting of N Homogeneous particles of equal masses, these particles being in interaction with each other by central forces. The conditions for the decomposition of the total energy of the system into a rotational energy and into an internal energy are indicated in the paper under review. (2 reproductions).

ASSOCIATION      Moscow State University
PRESENTED BY
SUBMITTED        2e March 1956
AVAILABLE        Library of Congress

Card 2/2

FILIPPOV, G.F.

56-4-50/52

AUTHOR: DAVYDOV,A.S., FILIPPOV,G.F.

TITLE: The Quadrupole Moments and the Zero Oscillations on the Surface of the Axially-symmetric Nuclei. (Kvadrupol'nyye momenty i nulevyye kolebaniya poverkhnosti aksial'no-simmetricheskikh yader, Russian).

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 4, pp 945 - 947 (U.S.S.R.)

ABSTRACT:
For the purpose of simplification the authors here investigate even-even atomic nuclei. In the generalized model of the nucleus the nucleons located outside the nucleus are described by means of the one-particle approximation, and the nucleons within the completely filled-up shells (nucleus trunk) are noticeable only by their collective properties. As collective coordinates the authors here selected the three EULER angles as well as the variables $\beta$ and $\gamma$, which characterize the deviation of the nucleus from the spherical shape. In adiabatic approximation investigation of the motion of the outer nucleons in the field of a nucleus trunk with fixed shape can be carried out. The energy of the interaction of the outer nucleons with the nucleus trunk (which are averaged over the state of motion $\langle H_w \rangle = A\beta\cos\gamma$ of the nucleons) will depend upon the coordinates $\beta$ and $\gamma$, and will play the part of an additional

Card 1/2

The Quadrupole Moments and the Zero            56-4-50/52
Oscillations on the Surface of the Axially-Symmetric Nuclei.

energy. This additional energy then determines the shape of the
nucleus which corresponds to equilibrium. The quantity $A$ depends
upon the number of the outer nucleons and upon their quantum
numbers, and can be positive as well as negative. First, an ex-
pression for the energy of the nucleus in the generalized model is
given. The nuclei apparently are rather stable as to a modification
of $\gamma$ with respect to the values 0 and $\pi$, (which correspond to
equilibrium) in accordance with the axially symmetric nuclei. There-
fore, the authors here investigate only such oscillations as are
connected with the modification of $\beta$ (by the retained values
$\gamma = 0, \pi$). The above mentioned formula for energy is now specialized
and discussed for these two special cases. A table gives the values
of the energy of the surface zero oscillations of a nucleus in the
S-state for those states of the outer nucleons which correspond
to the values of $\beta_0$, for the cases $\gamma = 0$, $\gamma = \pi$. The level $\gamma = \pi$
corresponds to the highest energy, this case corresponds to a
special type of degenerated states. (1 table).

ASSOCIATION:  Moscow State University.
PRESENTED BY:
SUBMITTED:    26.1.1957
AVAILABLE:    Library of Congress
Card 2/2

FILIPPOV, G.F.

AUTHORS: Davydov, A.S., Filippov, G.F.          56-3-25/59

TITLE: Collective Excitation of Even-Even Atomic Nuclei.
(Kollektivnyye vozbuzhdeniya chetno-chetnykh atomnykh yader)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 3, pp. 723-729 (USSR)

ABSTRACT: The collective excitation of the levels of axial-symmetrical even-even nuclei is theoretically treated by means of the increased Bohr nuclear model. It is shown that the collective excitation of such nuclei is characterized by 2 types: a) excitation which is accompanied by only a small variation of the nuclear quadrupole moment and b) excitation which is connected with an important variation of the nuclear quadrupole moment. The excitation mentioned at b) occurs especially in the case of nuclei which do not deviate to a great extent from the spherical form. In the case of nuclei deviating to a great extent from the spherical form the form mentioned at b) does not play any role in the case of transitions with small energies variations. For the first 4 - 5 excited states of the nuclei $Sn^{116}$, $Ba^{134}$, $Pt^{192}$, $Ge^{72}$, $Se^{76}$, $Xe^{128}$, $Cd^{114}$, $Pd^{106}$ the energies of the excited states as well as the inherent spin values are compared to the experimentally found values and in general a good

Card 1/2

Collective Excitation of Even-Even Atomic Nuclei.                    56-3-25/59

conformity is found. There are 2 figures, 2 tables, and 3 Slavic references.

ASSOCIATION:   Moscow State University (Moskovskiy gosudarstvennyy universitet)

SUBMITTED:     March 8, 1957.

AVAILABLE:     Library of Congress

Card 2/2

FILIPPOV, G.F.

20-4-17/60

AUTHOR:     Filippov, G. F.

TITLE:     The First Excited Levels of Axially Symmetrical Even-Even Nuclei. (Pervyye vozbuzhdennyye urovni aksial'no-simmetrichnykh chetno-chetnykh yader).

PERIODICAL:     Doklady Akad. Nauk SSSR, 1957, Vol. 115, Nr 4, pp. 696-698 (USSR)

ABSTRACT:     The present paper investigates the rotation vibration spectrum of the axially symmetrical nuclei in the approximation of the strong coupling. The conception of the conservation of the axial symmetry is evidently correct for the first excited levels. The Hamilton-function for the free oscillations of the nuclear trunk, resulting from the generalized model, are given. An even number of neutrons and protons lying above the shells changes the expression for the potential energy. The "excess" nucleons deform the trunk. The Schroedinger equation for the deformed nucleus is given. For the function $\Psi$ the author puts $\Psi(\beta,\theta,\varphi)=(u(\beta)/\beta)Y_l^m(\theta,\varphi)$ where $l$ assumes only even-numbered values. The equation (given here) for $u(\beta)$ has an exact solution when $l = 0$. In the case $l \neq 0$ the spectrum can be approximately determined and the equation for the function $u(\beta)$ is reduced to the equations for Hermite-functions. The energy spectrum resulting from this equation is illustrated by a sketch. From the generalized model the correct absolute values of the distances between the energy levels of the nuclei

Card 1/2

The First Excited Levels of Axially Symmetrical Even-Even Nuclei.  20-4-17/60

could hitherto not be derived. Therefore only the relation of the distances between the levels and the spins of the levels can be compared with the experiment. In order to determine the place of the nucleus in the diagram, the ratio $E_2/e_1$ was calculated, where $E_1$ and $E_2$ signify the energies of the first and the second excited level (starting the calculation with the energy of the ground state). Then the abscissa corresponding to the given value of $E_2/E_1$ and the sequence of the spins of these levels were determined. The author investigates all heavy and semi-heavy nuclei(A > 7o) whose spectra of the first excited levels are known. In a large group of nuclei the first two excited levels are approximately equidistant and in the case of positive parity have the spin 2. There are 1 figure and 13 references, 4 of which are Slavic.

PRESENTED:   March 13, by I.Ye . Tamm, Academician  (1957)

SUBMITTED:   March 2 , 1957

AVAILABLE:   Library of Congress

Card 2/2

21 (0)
AUTHORS:        Davydov, A. S., Filippov, G. F.                SOV/56-35-2-18/60

TITLE:          Rotation States of Nonaxial Nuclei (Vrashchatel'nyye
                sostoyaniya neaksial'nykh yader)

PERIODICAL:     Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
                Vol 35, Nr 2, pp 440-447 (USSR)

ABSTRACT:       In previous papers by the same authors (Refs 1 - 4) the energy
                levels of nonspherical nuclei were investigated on the basis
                of a generalized model of a nucleus according to Bohr and
                Mottelson (Bor, Mottel'son) (Refs 5 and 6) for collective
                excitation without disturbing axial symmetry. In the present
                paper a theory of energy states and of the transitions among
                them is worked out for nuclei without axial symmetry. It is
                shown that, though in the case of a disturbance of axial
                symmetry the rotation spectra in even-even nuclei change
                only relatively slightly (compared to those of axially
                symmetric nuclei), new rotation states (with J = 2, 3, 4....)
                occur. In the case of slight deviations from axial symmetry
                these levels are considerably higher and are undisturbed;
                in the case of major deviations from axial symmetry it is
                found that part of these additional levels is considerably

Card 1/2

Rotation States of Nonaxial Nuclei

SOV/56-35-2-18/60

reduced. Thus, the ratio of two excited levels (1. level - spin = 2) from $\infty$ to 2. In the second part of this paper the authors investigate the probability of electromagnetic transitions between the rotation levels of non-axially symmetric nuclei. A comparison between theory and experiment shows that the so-called $\gamma$-vibrational energy levels of even-even nuclei must be looked upon as rotation levels. The same appears to be true for several nuclei with a spin sequence of 0, 2, 2, 3. There are 1 figure, 3 tables, and 24 references, 6 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)
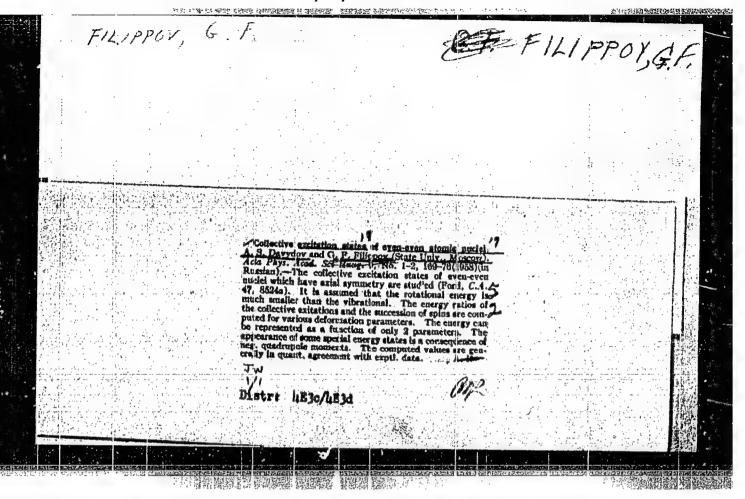
SUBMITTED: March 17, 1958

Card 2/2

DAVYDOV, A. S. and FILIPPOV, G. F.
Moscow State University.

"Rotational States in Even Atomic Nuclei."  Nuclear Physics,   v. 8, 3 (1958)
(North-Hooland Publishing Co., Amsterdam) pp. 237-249.

Abstract:  A theory of the energy states and the electromagnetic transisitions between
them is developed for nuclei which do not posses axial symmetry.  It is shown that
violation of axial symmetry does not significantly change the rotational states of
axial nuclei and leads to the appearance of new energy states.  The reduced pro-
babilities for E2 and M1 transitions between various rotational states are computed.

FILIPPOV, G.F.

FILIPPOV, G.F.

"Collective excitation states of even-even atomic nuclei."
A. S. Davydov and G. F. Filippov (State Univ., Moscow).
Acta Phys. Acad. Sci. Hung. 7, No. 1-2, 169-78 (1958) (in
Russian).—The collective excitation states of even-even
nuclei which have axial symmetry are stud'ed (Ford, C.A.
47, 8524a). It is assumed that the rotational energy is
much smaller than the vibrational. The energy ratios of
the collective exitations and the succession of spins are com-
puted for various deformation parameters. The energy can
be represented as a function of only 2 parameters. The
apjearance of some special energy states is a consequence of
neg. quadrupole moments. The computed values are gen-
erally in quant. agreement with exptl. data. — A. Ihm.

Jw

Distr: 4E3c/4E3d

21(0), 24(5)
AUTHORS:          Davydov, A. S., Filippov, G. F.                    SOV/56-35-3-21/61

TITLE:            Magnetic Transitions Between Collective Excited States of Even-
                  Even Nuclei (Magnitnyye perekhody mezhdu kollektivnymi
                  vozbuzhdennymi sostoyaniyami chetno-chetnykh yader)

PERIODICAL:       Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
                  Vol 35, Nr 3, pp 703-706 (USSR)

ABSTRACT:         The present paper is partly based on a previous work (Ref 1)
                  in which the authors calculated the probability for electric
                  quadrupole transitions between rotational states of non-axial
                  even-even nuclei; it was found that a number of energetic
                  states of non-axial nuclei can be well explained by assuming
                  that they refer to rotational states. In the present paper the
                  authors calculate the probability of magnetic dipole transi-
                  tions between rotational states with the spins $2^+$, $2^+$. Such
                  levels are observed in the case of the nuclei $Se^{76}$, $Te^{122}$,
                  $Os^{188}$, $Os^{186}$, $Pt^{192}$ etc. As already shown by reference 1, it is

Card 1/4          possible, by knowing the ratio between the second $2^+$-level and

the first, to determine the parameter $\mu$ and the ratio of the reduced probabilities for transitions. In the present paper the reduced probability of an M1 transition between $2^{+}$, $2^{+}$ states as well as the ratio between this transition and an E2 transition between the same states is calculated. The values obtained agree well with experimental results (Ref 3). For the intensity ratios of magnetic dipole- and electric quadrupole transitions the general formula $T(MJ)/T(E,J+1) \sim \left[ 25(2J+1)/A^{2/3}(\hbar\omega)_{MeV} \right]^{2}$ (according to reference 5) applies. For $A \sim 30$ and $\hbar\omega \sim 100$ keV the ratio is $\sim 10^{4}$, for heavy nuclei at $\hbar\omega \sim 1$ MeV it is $\sim 10$. For the ratio investigated by the authors the formula $T(M1)/T(E2) = (0,03k^{2})^{-1} \cdot \dfrac{B(M1; \ 22 - 21)}{B(E2; \ 22 - 21)}$ was derived, where $k = (E_{22} - E_{21})/\hbar c$. For the ratio of reduced transition probabilities (magnetic dipole $\longrightarrow$ electric quadrupole) it holds that $\dfrac{B(M1; \ 22 - 21)}{B(E2; \ 22 - 21)} = \dfrac{80}{7} \left( \dfrac{\mu_{o}g_{R}}{eZR_{o}^{2}} \right)^{2}$ ; it is, therefore, independent of $\mu$ and $\beta$. ($R_{o}$= nuclear radius)

Card 2/4

Magnetic Transitions Between Collective Excited States of Even-Even Nuclei

The numerical results for $\mu_c = 5,05.10^{-24}$ erg/G, $g_R = 0,4$, and $R_o = 1,2 \text{ A}^{1/3}.10^{-13}$ cm are:

| Nucleus | $E_{22}-E_{21}$ [keV] | $T(M1)/T(E2)$ | Percentage of E2 transition (experimental - Ref 3) |
|---|---|---|---|
| $Se^{76}$ | 643 | $9,8.10^{-2}$ | $98 \pm 1$ |
| $Te^{122}$ | 693 | $1,9.10^{-2}$ | $92 \pm 4$ |
| $Os^{186}$ | 627 | $6,5.10^{-3}$ | $99 \pm 1$ |
| $Os^{188}$ | 480 | $1,04.10^{-2}$ | $99,6$ |

There are 1 table and 4 references, 1 of which is Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: April 3, 1958

Card 3/4

FILIPPOV, G. F., Cand Phys-Math Sci (diss) -- "Collective excitation of atomic

nuclei".  Moscow, 1959.  8 pp (Moscow State Order of Lenin and Order of Labor

Red Banner U im M. V. Lomonosov), 130 copies (KL, No 9, 1960, 122)

21(1);24(5)

AUTHORS:      Davydov, A. S., Filippov, G. F.        SOV/56-36-5-30/76

TITLE:        On the Problem of the Shape of Even-even Nuclei
              (K voprosu o forme chetno-chetnykh yader)

PERIODICAL:   Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
              Vol 36, Nr 5, pp 1497-1502  (USSR)

ABSTRACT:     In the present very detailed paper a nonspherical nuclear
              model is investigated. First, the problem of non-sphericity
              is discussed by way of an introduction and discussed on the
              basis of the numerous works already published and dealing with
              this field and phenomena connected with it. Among other things
              it is shown that the majority of the properties of the first
              excited states of even-even nuclei may be well explained by the
              assumption that the nucleus has the shape of a triaxial ellipsoid
              when in equilibrium (Bohr). The authors investigated the
              possibility of a deviation of the equilibrium shape of a
              nucleus from axial symmetry by means of a new method which is
              based on a generalization of Bohr's method (Ref 2). A model is
              investigated in which the nucleus consists of a core of
Card 1/2       several nucleons and 2 equivalent external nucleons in a shell

On the Problem of the Shape of Even-even Nuclei    SOV/56-36-5-30/76

with a certain j-value. According to Bohr the ellipsoidal shape of the nucleus may be characterized by the two parameters $\beta$ and $\gamma$ ; the authors derive formulas representing nuclear energy as functions of $\beta$ and $\gamma$ . The two figures show nuclear energy as a function of $\gamma$ and l with J = 2 and J = 4 at various l-values. It is shown that in the ground state of the nucleus a nonaxial shape of the nucleus with $j > 3/2$ corresponds to the energy minimum. Several experimental data are given which are in keeping with the authors' theory. There are 2 figures and 10 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: November 20, 1958

Card 2/2

83742

S/056/60/038/004/035/048
B006/B056

24.6520

AUTHOR:      Filippov, G. F.

TITLE:       The Equilibrium Shape of Atomic Nuclei/9

PERIODICAL:  Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
             Vol. 38, No. 4, pp. 1316 - 1319

TEXT:  The conception that deformed nuclei have a symmetry axis (gener-
alized model by Bohr-Mottelson ) made it possible to give a theoretical
description of experimentally observed rotational excitations and to
verify various calculations. Recent experimental data concerning rota-
tional spectra have, however, been found to contain anomalies with re-
spect to several nuclei, which cannot be described by introducing simple
corrections to a rotational state, which would correspond to an axially
symmetric equilibrium shape. If a disturbance of the axial symmetry of
the equilibrium shape is assumed, the anomalies appear to be plausible.
Thus, the author deems it necessary to re-check the theoretical proofs
of the existence of a symmetry axis in deformed nuclei. He first dis-
cusses an investigation of the equilibrium shape of a nucleus having one

Card 1/2

The Equilibrium Shape of Atomic Nuclei

83742
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B006/B056

external nucleon, which was carried out by A. Bohr (Ref. 3). He points out that the energy of the interaction bet*.:en the external nucleon and the core deformations have been calculated only in first perturbation-theoretical approximation, but that the contributions made by higher approximations must be known for determining the equilibrium shape. Therefore, Bohr's proof of the existence of a symmetry axis in a nucleus with an external nucleon cannot be considered to be fully correct. The attempt is made to determine the equilibrium shape of a nucleus with an external nucleon more exactly on the assumption that the deformations are small. The results obtained lead to the same conclusions as Bohr's calculations. An investigation of many-particle configurations shows that in this case non-axial equilibrium shapes are produced. The author thanks A. S. Davydov for discussions. B. L. Birbrair, L. K. Peker, L. A. Sliv, and B. T. Geylikman and D. A. Zaikin are mentioned. There are 4 figures and 10 references: 5 Soviet, 2 Danish, 2 US, and 1 Dutch.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: November 19, 1959

Card 2/2

89207

9.9300
26.2311
AUTHORS:     Romanov, Yu. A., Filippov, G. F.

S/056/61/040/001/013/037
B102/B204

TITLE:       The interaction between currents of fast electrons and
             longitudinal plasma waves

PERIODICAL:  Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40,
             no. 1, 1961, 123-132

TEXT:   The present paper is a consequence of an experimental study by
M. D. Gabovich and L. L. Pasechnik (Ref. 1), in which the anomalous elec-
tron scattering effects occurring in the interaction of fast electron beam
and plasma had been determined.  A. A. Vlasov, as well as Bohm and Gross have
already attempted to interpret the results obtained by Gabovich and
Pasechnik by assuming a modulation of the electron beam.  It is, however, a
fact that the random fluctuations increased by the electron beam are lon-
gitudinal plasma waves.  Their group velocity is in the direction of the
beam, and in a semi-infinite plasma without any reflecting surfaces, such
waves are not able to induce a sufficient modulation of the beam.  By ex-
plaining the anomalies in the interaction of plasma and electron beam it

Card 1/3

The interaction between ...

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suffices to assume an instability of the electron beam in the plasma. The slight disturbances at the entrance of the beam grow exponentially with the distance from the boundary, and at a distance of about 1 cm, their amplitude is high enough to cause the anomalous scattering of the beam. The theory of the growth of these oscillations has been developed by Yu. L. Klimontovich and Kahn. Above all the results obtained by Klimontovich are utilizing the present paper. The authors here obtain analogous equations of motion as he did, but they have a wider range of application. They hold also if the plasma oscillations are not in thermal equilibrium, and if the electron distribution function deviates from that of Maxwell. In the following, it is possible to obtain equations suitable for analyzing the non-exponential stage of the intensity growth with time of the plasma waves under the action of electron currents of any velocity distribution. It is found on this occasion that with slowing down of the beam strong scattering occurs in the latter, in the course of which electrons with velocities greater or smaller than the mean initial velocity, occur. These equations go over into the aforementioned equations of motion in application to the electron fluxes with large velocity spreads. The accuracy of these equations is checked on a basis of a concrete example. In the equations ob-

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